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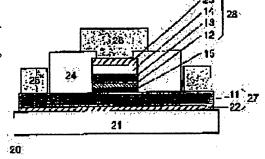
WATANABE KATSURO

(54) FERROMAGNETIC TUNNEL JUNCTION ELEMENT

(57) Abstract:

PROBLEM TO BE SOLVED: To suppress the reduction in the magnetoresistance effect due to destruction of a tunnel barrier layer and thereby achieve uniformity and reproducibility, by arranging an amorphous ferromagnetic layer on at least the interface of one of a ferromagnetic layer and the tunnel barrier layer.

SOLUTION: A base film 22 for improving the orientability of a free layer 11 of a ferromagnetic tunnel junction, the layer 11, and an amorphous ferromagnetic layer 15 for improving heat resistance are formed on an oxide layer-deposited silicon substrate 21. A tunnel barrier layer 12 is formed on the layer 15 by preparing an Al layer, and oxidizing the surface of the Al layer by a plasma oxidation method. Further, a fixed layer 13, an antiferromagnetic layer 14, and a protection film 23 are sequentially formed. Next, a lower electrode layer 26 and an upper electrode layer 27 are processed into predetermined configurations. Further, an Al2O3 insulating layer 24 for preventing contact between the layers 26 and 27 is formed, and then patterned, and for contact with the lower/upper



electrode layers 27 and 28, Au layers are formed as lower/ upper electrode wiring layers 25 and 26, whereby a ferromagnetic tunnel junction element 20 is prepared.

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